<div align="center">Remarks</div>

Claims 6 and 7 are herein amended. Support for amendment to claim 6 is found in claims 1 and 6 as originally filed. Support for amendment to claim 7 is found in claims 6 and 7 as originally filed.

Claims 14 and 15 are herein added. Support for claim 14 is found in claims 1 and 6 as originally filed. Support for claim 15 is found in claims 1 and 10 as originally filed.

Claims 1-15 are pending herein. No new matter has been added, and no new material presented that would necessitate an additional search on the part of the Examiner.

<div align="center">Objections to the specification</div>

The Office Action on page 2 objects to the abstract of the specification. Applicants herein amend the abstract to correct a clerical error by removing the phrase "Fig. 3" from line 8. Applicants respectfully request that this objection be withdrawn.

In response to objection to the specification for failing to include headings, Applicants assert that both 37 C.F.R. 1.77(a) and 37 C.F.R. 1.77(b) state an order of appearance, not a requirement for section headings. For these reasons, this objection can properly be withdrawn.

<div align="center">Claims are novel</div>

The Office Action on page 2 rejects claim 1-5 under 35 U.S.C. §102(b) in view of Declerck et al. (Automatic Registration and Alignment on a Template of Cardiac Stress and Rest Reoriented SPECT Images, *IEEE Transactions on Medical Imaging*, Vol. 16, No. 6, December 1997).

Prior to analyzing the art cited in the Office Action, Applicants believe that a brief description of the subject matter of independent claim 1 would be of use to the Examiner.

Claim 1 is directed to a method for analyzing perfusion images, in particular MR perfusion images, of a human or animal organ, including the steps of: (a) defining at least one contour of the organ, and (b) establishing at least one perfusion parameter of a region of interest of said organ within a boundary defined by the at least one contour, where steps (a) and (b) are repeated in a series of iterative steps where for each subsequent iterative step the definition of the at least one contour in step (a) is varied, and the series of iterative steps is terminated after reaching an optimal value for the at least one perfusion parameter in step (b).

The legal standard for rejection of a claim under 35 U.S.C. §102 is identity. Applicants show below that Declerck is not the same as the subject matter of the present claims, and therefore fails to anticipate the claims.

Declerck et al. (Automatic Registration and Alignment on a Template of Cardiac Stress and Rest Reoriented SPECT Images, *IEEE Transactions on Medical Imaging*, Vol. 16, No. 6, December 1997)

Declerck shows comparing single photon emission computed tomography (SPECT) images, including a rest image and a stress image, to provide a classification of the myocardium. See Declerck, page 727. Declerck shows a 3-D matching procedure to match stress and rest images to a template image of the heart to compare stress and rest perfusion images of a patient. Ibid., page 728. The stress image and rest image are matched using a feature-points-based method, which yields an affine transformation defining a correspondence between a point in the stress image and a point in the rest image. Ibid., page 728. A template heart is matched to the stress image using local spline transformations, and the stress and rest images are resampled in its geometry. Ibid., pages 728-729. The output of this transformation is a new stress/rest pair in a new geometry, and the coordinates of a 3-D

voxel in any of the stress, rest, or template images correspond to the same part of the myocardium, allowing comparison. Ibid., page 729.

Declerck fails to show repeating the steps of defining at least one contour of an organ and establishing at least one perfusion parameter of a region of interest of the organ within a boundary defined by the at least one contour in a series of iterative steps where at least one contour is varied, as is the subject matter of claim 1.

Declerck also fails to show a series of iterative steps that is terminated after reaching an optimal value for the at least one perfusion parameter, as is the subject matter of claim 1.

For any of these reasons, claim 1 is not the same as Declerck, therefore this claim is not anticipated by Declerck. Claims 2-5 depend directly or indirectly on claim 1 and incorporate all of the subject matter of these claims and contain additional subject matter. Therefore claims 2-5 also are not anticipated by Declerck.

Applicants assert that claims 1-5 comply with 35 U.S.C. §102(b), and respectfully request that this rejection be withdrawn.

Claims are not obvious

The Office Action on page 5 rejects claims 6-13 under 35 U.S.C. §103(a) in view of Declerck et al. (Automatic Registration and Alignment on a Template of Cardiac Stress and Rest Reoriented SPECT Images, *IEEE Transactions on Medical Imaging*, Vol. 16, No. 6, December 1997) in combination with Aiazian (U.S. patent number 7,024,024, issued April 4, 2006). Declerck is characterized above.

Prior to analyzing the art cited in the Office Action, Applicants believe that a brief description of the subject matter of independent claim 6 as here amended and claim 10 would be of use to the Examiner.

Claim 6 as here amended is directed to a software program for a computer of an apparatus implemented to execute a method for analyzing perfusion images, in particular MR perfusion images, of a human or animal organ including the steps of: (a) defining at least one contour of the organ, and (b) establishing at least one perfusion parameter of a region of interest of said organ within a boundary defined by the at least one contour, where steps (a) and (b) are repeated in a <u>series of iterative steps</u> where for each subsequent iterative step the definition of the at least one contour in step (a) is varied, and <u>the series of iterative steps is terminated after reaching an optimal value for the at least one perfusion parameter</u> in step (b).

Claim 10 is directed to an apparatus for analyzing perfusion images, in particular MR perfusion images, of a human or animal organ, arranged to execute the steps of: (a) defining at least one contour of the organ, and (b) establishing at least one perfusion parameter of a region of interest of said organ within a boundary defined by the at least one contour, where during operation <u>steps (a) and (b) are repeated in a series of iterative steps</u> where for each subsequent iterative step the definition of the at least one contour in step (a) is varied, and the series of iterative steps is terminated after reaching an optimal value for the at least one perfusion parameter in step (b).

<u>Declerck et al. (Automatic Registration and Alignment on a Template of Cardiac Stress and Rest Reoriented SPECT Images, *IEEE Transactions on Medical Imaging*, Vol. 16, No. 6, December 1997)</u>

Declerck is characterized above.

Declerck fails to teach or suggest a software program or an apparatus that executes a method for repeating the steps of defining at least one contour of an organ and establishing at least one perfusion parameter of a region of interest of the organ within a boundary

defined by the at least one contour in a series of iterative steps where at least one contour is varied, as is the subject matter of claims 6 and 10.

Further, Declerck fails to teach or suggest that the series of iterative steps is terminated after reaching an optimal value for the at least one perfusion parameter, as is the subject matter of claims 6 and 10.

Most important, Declerck fails to teach or suggest a software program for a computer of an apparatus implemented to execute a method for analyzing perfusion images, as admitted in the Office Action on page 5.

For any of these reasons, Declerck alone does not render obvious the present claims.

Applicants now characterize the additional reference cited in combination with Declerck prior to analyzing the combination.

Aiazian, U.S. patent number 7,024,024, issued April 4, 2006

Aiazian shows enhancing analysis of in vivo images by providing automatic calculation and display of normalized data sets and multi-dimensional images. See Aiazian, column 1, lines 65-67 to column 2, lines 1-2. Aiazian shows further enhancing images by providing automated or semi-automated division of in vivo images into user-defined multi-dimensional segments. Ibid., column 2, lines 2-5. Comparison studies of regions are performed by simultaneously displaying corresponding regions of interest imaged at distinct periods of time. Ibid., column 2, lines 5-8.

Aiazian fails to teach or suggest any software program or apparatus that executes a method of repeating the steps of defining at least one contour of an organ and establishing at least one perfusion parameter of a region of interest of the organ within a boundary defined

by the at least one contour in a <u>series of iterative steps where at least one contour is varied</u>, as is the subject matter of claims 6 and 10.

Further, Aiazian fails to teach or suggest any software program or apparatus that implements a method in which the <u>series of iterative steps is terminated after reaching an optimal value for the at least one perfusion parameter</u>, as is the subject matter of claims 6 and 10.

As Aiazian fails to cure the defects of Declerck with respect to claims 6 and 10, therefore claims 6 and 10 are not obvious in view of Declerck and Aiazian, alone or in combination.

Claims 7-9 and 11-13 depend directly or indirectly on claims 6 and 10, respectively, and incorporate all of the subject matter of these claims and contain additional subject matter. Therefore these claims also are not obvious in view Declerck and Aiazian, alone or in combination.

For at least these reasons, Applicants assert that the present claims comply with 35 U.S.C. §103(a), and respectfully request that rejection of claims 6-13 under 35 U.S.C. §103(a) be withdrawn.

<div align="center">Legal analysis</div>

Whether an invention would have been obvious under 35 U.S.C. §103(a) is a legal conclusion based on underlying findings of fact. *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000).

The *Manual of Patent Examining Procedure* states: "[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some <u>suggestion or motivation</u>, either in the references themselves or in the knowledge generally available to

one of ordinary skill in the art, to modify the reference or to combine reference teachings.

Second, there must be a reasonable expectation of success. Finally, the prior art reference

(or references when combined) must teach or suggest all the claim limitations. The teaching

or suggestion to make the claimed combination and the reasonable expectation of success

must both be found in the prior art, and not based on applicant's disclosure." [emphases

added] *Manual of Patent Examining Procedure* §2142 (8th Ed. Rev.2, May 2, 2004); *In re*

Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Failure of the cited prior art to teach or suggest all the claim limitations

To establish a *prima facie* case for obviousness of a claimed invention, all of the

claim limitations must be taught or suggested by the prior art. *Manual of Patent Examining*

Procedure, §2143.03, p. 108 (8th Ed. Rev.2, May 2, 2004); *In re Royka,* 490 F.2d 981, 180

USPQ 580 (CCPA 1974).

Claim 6 as here amended is directed to a software program for a computer of an

apparatus implemented to execute a method for analyzing perfusion images, in particular

MR perfusion images, of a human or animal organ including the steps of: (a) defining at

least one contour of the organ, and (b) establishing at least one perfusion parameter of a

region of interest of said organ within a boundary defined by the at least one contour, where

steps (a) and (b) are repeated in a series of iterative steps where for each subsequent iterative

step the definition of the at least one contour in step (a) is varied, and the series of iterative

steps is terminated after reaching an optimal value for the at least one perfusion parameter in

step (b).

Claim 10 is directed to Apparatus for analyzing perfusion images, in particular MR

perfusion images, of a human or animal organ, arranged to execute the steps of: (a) defining

at least one contour of the organ, and (b) establishing at least one perfusion parameter of a

region of interest of said organ within a boundary defined by the at least one contour, where

during operation steps (a) and (b) are <u>repeated in a series of iterative steps</u> where for each

subsequent iterative step the definition of the at least one contour in step (a) is varied, and

<u>the series of iterative steps is terminated after reaching an optimal value for the at least one</u>

<u>perfusion parameter</u> in step (b).

The cited references fail to teach or suggest the subject matter of claims 6 and 10,

based on the factual analysis of each reference above. Therefore, by the legal criteria

discussed above, the underlying facts of the content of the cited prior art and of the present

pending claims show that the prior art fails to teach or suggest all the limitations of the

claims of the present invention. Therefore, a *prima facie* case that claims 6-13 of the present

invention are obvious has not been made.

Claims 7-9 and 11-13 that depend directly or indirectly from claims 6 and 10,

respectively, and incorporate the subject matter of claims 6 and 10 and contain additional

subject matter, also are not obvious in light of the cited references. For at least these

reasons, obviousness of the claims has not been established.

<u>No motivation to combine references</u>

To establish obviousness based on a combination of the elements disclosed in the

prior art in the absence of any hindsight, there must be some <u>motivation, suggestion or</u>

<u>teaching of the desirability</u> of making the specific combination that was made by the

applicants. *Id.* The teaching or suggestion, not merely to make the claimed combination,

but also of a reasonable expectation of success, must both be found in the prior art, and not

based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488; 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Aiazian (2006), the more recent of the primary references, fails to cite Declerck (1997), the earlier of the cited references. According to the legal criteria discussed above, Aiazian <u>fails to provide any motivation for making a combination with Declerck, let alone suggest that such a combination would have been successful</u> in arriving at the claimed subject matter. As there is no citation in Aiazian to Declerck, there can be no teaching or suggestion even to combine these references. For these reasons also, the combination of these references fails to teach or suggest the present claims.

Further, these references neither teach nor suggest <u>how to modify any of the technology</u> of any of the other references in order to combine with the other references to arrive at the subject matter of the claims of the present application.

As <u>neither Aiazian nor Declerck provide any motivation</u> to one of ordinary skill in the art to have combined any elements of these primary references to have arrived at the present claims of Applicants' invention, then <u>making the combination is using Applicants' own specification as a blueprint</u> to reconstruct the invention, which is impermissible hindsight, viz., extracting merely an element or word from each of the references, to attempt to reconstruct Applicants' claims, when neither of the references explicitly would have taught or suggested a combination, let alone taught or suggested a reasonable expectation of success in arriving at the claimed subject matter.

For any of the above reasons, Applicants assert that claims 6-13 are not obvious, and respectfully request that the rejection of claims 6-13 under 35 U.S.C. §103(a) be withdrawn.

Summary

On the basis of the foregoing reasons, Applicants respectfully submit that the pending claims are in condition for allowance, which is respectfully requested.

If there are any questions regarding these remarks, the Examiners are invited and encouraged to contact Applicants' representative at the telephone number provided.

Respectfully submitted,

Sonia K. Guterman
Reg. No. 44,729
Sara E. Finiki
Reg. No. 59,206
Lawson & Weitzen, LLP
88 Black Falcon Ave., Suite 345
Boston, Massachusetts 02210-2481
Tel: (617) 439-4990
Fax: (617) 439-3987